fect conductor, such as honey, and which, though it communicated weak shocks, yet did not decompose water.

The author also ascertained that the electrical shocks of the torpedo, even when powerful, produced no sensible effect on an extremely delicate magnetic electrometer. He explains these negative results by supposing that the motion of the electricity in the torpedinal organ is in no measurable time, and wants that continuity of current requisite for the production of magnetic effects.

On a Method of comparing the Light of the Sun with that of the fixed Stars. *By* William Hyde Wollaston, *M.D. F.R.S.* Read December 11, 1828. [*Phil. Trans.* 1829, *p.* 19.]

In the Philosophical Transactions for the year 1767, a suggestion is thrown out by Mr. Michell, that a comparison between the light received from the sun and any of the fixed stars, might furnish data for estimating their relative distances; but no such direct comparison had been attempted. Dr. Wollaston was led to infer from some observations that he made in the year 1799, that the direct light of the sun is about one million times more intense than that of the full moon, and therefore very many million times greater than that of all the fixed stars taken collectively. In order to compare the light of the sun with that of a star, he took, as an intermediate object of comparison, the light of a candle reflected from a small bulb, about a quarter of an inch in diameter, filled with quicksilver, and seen, by one eye, through a lens of two inches focus, at the same time that the star or the sun's image, placed at a proper distance, was viewed by the other eye through a telescope. The mean of various trials seemed to show that the light of Sirius is equal to that of the sun seen in a glass bulb one tenth of an inch in diameter, at the distance of 210 feet, or that they are in the proportion of one to ten thousand millions; but as nearly one half of the light is lost by reflection, the real proportion between the light from Sirius and the sun is not greater than that of one to twenty thousand millions. If the annual parallax of Sirius be half a second, corresponding to a distance of 525,481 times that of the sun from the earth, its diameter would be 3·7 times that of the sun, and its light 13·8 times as great. The distance at which the sun would require to be viewed, so that its brightness might be only equal to that of Sirius, would be 141,421 times its present distance; and if still in the ecliptic, its annual parallax in longitude would be nearly $3''$; but if situated at the same angular distance from the ecliptic as Sirius is, it would have an annual parallax, in latitude, of $1''{\cdot}8$.

On the Water of the Mediterranean. *By* William Hyde Wollaston, *M.D. F.R.S.* Read December 18, 1828. [*Phil. Trans.* 1828, *p.* 29.]

The late Dr. Marcet in his examination of sea-water, of which he has given an account in the Philosophical Transactions for 1819, had

been unable, for want of a sufficient number of specimens of water taken at various depths in the Mediterranean, to draw any certain inference as to what becomes of the vast amount of salt brought into that sea by the constant current which sets in from the Atlantic through the Straits of Gibraltar, and which, on the evaporation of the water, must either remain in the basin of the Mediterranean, or escape by some hitherto unexplained means. In the hope of obtaining further evidence on this question, he had requested Captain Smyth, R.N., who was engaged in a Survey of that sea, to procure specimens of water from the greatest accessible depths. The specimens collected by Captain Smyth were, in consequence of Dr. Marcet's death, given to other persons, and applied to other objects. Dr. Wollaston, however, fortunately obtained the three remaining bottles of the collection.

The contents of one of these, taken up at about fifty miles within the Straits, and from a depth of 670 fathoms, was found to have a density exceeding that of distilled water by more than four times the usual excess; and accordingly, it left upon evaporation more than four times the usual quantity of saline residuum. The result of the examination of this specimen accords completely with the anticipation, that a counter current of denser water might exist at great depths in the neighbourhood of the Straits, capable of carrying westward into the Atlantic as much salt as enters into the Mediterranean with the eastward current near the surface. If the two currents were of equal breadth and depth, the velocity of the lower current need only be one fourth of that of the upper current, in order to prevent any increase of saltness in the Mediterranean.

An Account of the preliminary Experiments and ultimate Construction of a Refracting Telescope of 7·8 *inches aperture, with a fluid concave Lens. In a Letter addressed to* Davies Gilbert, *Esq. P.R.S. By* Peter Barlow, *Esq. F.R.S. &c.* Read December 18, 1828. [*Phil. Trans.* 1829, *p.* 33.]

The author gives an account of the continuation of his experiments on the construction of refracting telescopes with fluid lenses, which the aid furnished him by the Board of Longitude enabled him to pursue. The instrument he particularly describes has a clear aperture of 7·8 inches, which exceeds by about an inch that of the largest refracting telescope in this country. The whole length of the tube, with the eye-piece, is 12 feet, but its effective focus is 18 feet. It carries a power of 700 on the closest double stars in South's and Herschel's catalogue, and shows them round and defined. This telescope is mounted on a revolving stand, which works with considerable accuracy as an azimuth and altitude instrument. The weight of the stand is about 400 pounds, and that of the telescope 130 pounds, being purposely made heavy in order to obtain steadiness; yet its motions are so smooth, and the power so arranged, as to be easily manageable by one person; and the star may be followed by a slight